

REMARKS

The Office Action dated June 6, 2005 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1, 11-13, 19, 26-32, and 37-39 17 have been amended. Claims 45-51 have been added. No new matter has been added, and no new issues are raised which require further consideration and/or search. Claims 1-51 are submitted for consideration.

The drawings were objected to because Figures 1, 2 and 4 allegedly contain handwritten markings or notations. Corrected drawing sheets in compliance with 37 CFR 1.21(d) are attached to this Response. Therefore, Applicants respectfully request that this objection be withdrawn.

Claims 1-6, 9-14, 16-23, 25-40 and 42-44 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,148,410 to Baskey et al. in view of U.S. Patent No. 6,556,547 to Srikanth et al. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claims 1, 11, 12, 13, 19, 37, 38, and 39.

Claim 1, upon which claims 2-10 depend, recites a link protocol redundancy method including the steps of providing a router having an active processor and coupling a standby processor to the active processor. The method also includes forwarding network link protocol information from the active processor to the standby processor for synchronizing link configuration and link protocol states of the active processor at the

standby processor upon coupling of the standby processor to the active processor by maintaining a synchronization state machine for each task within a protocol. The method further includes switching the router to the standby processor when a failure is detected at the active processor. All states of the link protocol immediately function as if the failure had not occurred. A hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor.

Claim 11 recites an OSPF protocol redundancy method including the steps of providing a router having an active processor and coupling a standby processor to the active processor. The method also includes forwarding network OSPF protocol information from the active processor to the standby processor for synchronizing OSPF configuration and OSPF protocol states of the active processor at the standby processor by maintaining a synchronization state machine for each task within a protocol. The method further includes switching the router to the standby processor when a failure is detected at the active processor. All states of the OSPF protocol immediately function as if the failure had not occurred. A hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active

processor and the standby processor.

Claim 12 recites a link protocol redundancy method including the steps of providing a router having an active processor and coupling a standby processor to the active processor. The method also includes forwarding network link protocol information from the active processor to the standby processor for synchronizing link configuration and link protocol states of the active processor at the standby processor by maintaining a synchronization state machine for each task within a protocol the link protocol information is link-state database information, OSPF configuration information, OSPF adjacencies information, OSPF interface information and OSPF global protocol information. The method further includes switching the router to the standby processor when a failure is detected at the active processor. All states of the link protocol immediately function as if the failure had not occurred. A hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor.

Claim 13, upon which claims 14-18 depend, recites a method for implementing OSPF redundancy including the steps of providing a router having an active processor means and a standby processor means and building a hidden OSPF interface on the active processor means and a hidden OSPF interface on the standby processor means. The hidden OSPF interface on the active processor means and the hidden OSPF interface on

the standby processor means being unexposed and at least one adjacency for synchronizing database on the active processor means and on the standby processor means being automatically built over the hidden OSPF interface on the active processor means and the hidden OSPF interface on the standby processor means. The method also includes connecting the hidden OSPF interface of the active processor means to the hidden OSPF interface of the standby processor means over a communications link. The method further includes synchronizing an OSPF routing database using an OSPF protocol over the hidden OSPF interface, such that the OSPF routing database is synchronized when the hidden OSPF interface of the active processor means and the hidden OSPF interface of the standby processor means reach a full adjacency state. The method also includes transferring OSPF protocol information from the hidden OSPF interface of the active processor means to the hidden OSPF interface of the standby processor means over the communications link to mirror states of the active processor means and the standby processor means by maintaining a synchronization state machine for each task within a protocol. The method also includes removing the hidden interface of the active processor means and the hidden interface of the standby processor means and assuming control by the standby processor means when a failure is detected in the active processor means.

Claim 19, upon which claims 20-36 depend, recites a system for providing link protocol redundancy in a router including an active processor and a standby processor. The system also includes means for forwarding network link protocol information from the active processor to the standby processor for synchronizing link configuration and

link protocol states of the active processor at the standby processor including a redundant card manager to maintain a synchronization state machine of the link protocol states for tasks of the protocol. The system further includes means for switching the router to the standby processor when a failure is detected at the active processor. All states of the link protocol immediately function as if the failure had not occurred. A hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor.

Claim 37 recites a system for providing open shortest path first (OSPF) protocol redundancy in a router including an active processor and a standby processor. The system also includes means for forwarding network open shortest path first (OSPF) protocol information from the active processor to the standby processor for synchronizing link configuration and open shortest path first (OSPF) protocol states of the active processor at the standby processor including a redundant card manager to maintain a synchronization state machine of the link protocol states for tasks of a protocol. The system further includes means for switching the router to the standby processor when a failure is detected at the active processor. All states of the open shortest path first (OSPF) protocol immediately function as if the failure had not occurred. A hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one

hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor.

Claim 38 recites a system for providing open shortest path first (OSPF) protocol redundancy in a router including an active processor and a standby processor. The system further includes means for forwarding network open shortest path first (OSPF) protocol information from the active processor to the standby processor for synchronizing link configuration and open shortest path first (OSPF) protocol states of the active processor at the standby processor link-state database information, OSPF configuration information, OSPF adjacencies information, OSPF interface information and OSPF global protocol information. The means for forwarding includes a redundant card manager to maintain a synchronization state machine of the OSPF protocol states for tasks of a protocol. The system also includes means for switching the router to the standby processor when a failure is detected at the active processor. All states of the open shortest path first (OSPF) protocol immediately function as if the failure had not occurred. A hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor.

Claim 39, upon which claims 40-44 depend, recites a system for implementing OSPF redundancy in a router including an active processor means and a standby

processor means. The system also includes means for building a hidden OSPF interface on the active processor means and a hidden OSPF interface on the standby processor means, the hidden OSPF interface on the active processor means and the hidden OSPF interface on the standby processor means being unexposed and at least one adjacency for synchronizing database on the active processor means and on the standby processor means being automatically built over the hidden OSPF interface on the active processor means and the hidden OSPF interface on the standby processor means. The system also includes means for connecting the hidden OSPF interface of the active processor means to the hidden OSPF interface of the standby processor means over a communications Link. The system further includes means for synchronizing an OSPF routing database using an OSPF protocol over the hidden OSPF interface, such that the OSPF routing database is synchronized when the hidden OSPF interface of the active processor means and the hidden OSPF interface of the standby processor means reach a full adjacency state. The system also includes means for transferring OSPF protocol information from the hidden OSPF interface of the active processor means to the hidden OSPF interface of the standby processor means over the communications link to mirror states of the active processor means and standby processor means. The system also includes a redundant card manager to maintain a synchronization state machine of the states for tasks of the OSPF protocol and means for removing the hidden interface of the active processor means and the hidden interface of the standby processor means. The system further includes means for assuming control by the standby processor means when a failure is

detected in the active processor means.

As will be discussed below, the cited prior art references of Baskey et al. and Srikanth et al. fail to disclose or suggest the elements of any of the presently pending claims.

Baskey relates to a fault tolerant recoverable TCP/IP connection router. Baskey describes an active connection router (CR) 100 and a standby connection router (CR) 105. CRs 100 and 105 are assigned a function and a state on a per Virtual Encapsulated Cluster (VEC) basis. Standby CR 105 monitors major activities of active CR 100, so that configuration and connection tables 107 and 106 of active CR 100 and standby CR 105 are synchronized. Standby CR 105 switches states and becomes the active CR when active CR 100 fails. Standby CR 105 performs IP takeover by issuing a gratuitous ARP message, i.e., an ARP message to itself. The gratuitous ARP is broadcasted to all directly attached networks belonging to the logical subnet of the VEC. Previous hop(s) IP routers 130 and 140 update their ARP tables. The ARP table update causes all traffic for the VEC to go to the new active CR 105. Referring to Figure 2 of Baskey, a FTR-CR includes a synchronization manager 220 that synchronizes internal tables 106 and 107. SM 220 is connected to a monitoring manager 240 that monitors the state of its own FTR-CR.

Srikanth relates to a method and apparatus providing for router redundancy of non-internet protocols using the virtual router redundancy protocol. Srikanth describes a router providing router redundancy and fail-over protection for Internet Protocol.

Srikanth also describes that next hop routers can be dynamically configured at each node, using a dynamic routing protocol such the Routing Information Protocol (RIP) or Open Shortest Path First (OSPF) dynamic routing protocols. The reliability provided by a dynamic routing protocol is at the expense of the node and router processing overhead, network overhead, interoperability problems, and the like, according to Srikanth. Referring to Figure 3 of Srikanth, node 115 waits until it has an IPX datagram to transmit to another node in a different IPX network and before it checks an internal table or cache, such as an RIP table, at step 320, for a MAC address associated with the IPX address of the next hop IPX router.

Applicant submits that the combination of Baskey and Srikanth simply fails to teach or suggest the combination of elements recited in claims 1, 11, 12, 13, 19, 37, 38, and 39. Each of claims 1, 11, 12, 13, 19, 37, 38, and 39 recites, in part a hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor. There is no teaching or suggestion in the cited references of Baskey et al. and Srikanth et al. of synchronizing databases by adjacencies on hidden interfaces as disclosed on page 7, lines 16-25 of the present application and recited in each of independent claims 1, 11, 12, 13, 19, 37, 38, and 39. Claim 5 currently recites hidden interfaces and the Office Action cites Col. 4, lines 54-67 of Baskey et al. as teaching the hidden interfaces. As such, the Office

Action seems to suggest that the synchronization manager which is disclosed on Col. 4, lines 54-67 of Baskey et al. is equivalent to the hidden interfaces of the present invention.

However, the cited sections of Baskey et al. only discusses a synchronization manager that synchronizes internal data on the active router with the synchronization manager on the standby router. Thereafter, according to Baskey et al., the synchronization manager on the standby router updates the appropriate tables. There is no teaching or suggestion in Baskey et al. that the synchronization manager is unexposed outside the system. Furthermore, there is no teaching or suggestion in Baskey et al. that the synchronization manager is created for each area, i.e., a group of contiguous networks and attached hosts. Instead, the synchronization manager, according to at least Col. 3, lines 44-47 of Baskey et al., only synchronizes internal tables of the active router. There also is no teaching or suggestion in Baskey et al. of hidden adjacencies being automatically built on the hidden interface.

Srikanth et al. does not cure any of the deficiencies of Baskey et al. as outlined above. Specifically, Srikanth et al. does not teach or suggest a hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor as recited in claims 1, 11, 12, 13, 19, 37, 38, and 39. Therefore Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Baskey et al. nor Srikanth

et al., whether taken singly or combined, teaches or suggests each feature of claims 1, 11, 12, 13, 19, 37, 38, and 39 and hence, dependent claims 2-6, 9-14, 16-23, 25-40 and 42-44 thereon.

Claims 7, 8, 15, 24 and 41 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Baskey in view of an Official Notice, as evident by the Microsoft Computer Dictionary. The Office Action alleges that features of these claims, such as Inter Process Control, “are well known and expected in the art.” The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claims 1, 13, 19, and 39.

Claim 7 and 8 depend on claim 1, discussed above. Claim 15 depends on claim 13, discussed above. Claim 24 depends on claim 19, discussed above. Claim 41 depends on claim 39, discussed above. Thus, each of claims 7, 8, 15, 24 and 41 incorporates all of the elements recited in each of claims 1, 13, 19, and 39, discussed above. The Office Notice does not cure any of the deficiencies of Baskey et al. as outlined above with respect to claims 1, 13, 19, and 39. Specifically, the Official Notice does not teach or suggest a hidden interface is created on both the active processor and the standby processor for each area during initial synchronization, the hidden interface being unexposed, and at least one hidden adjacency being automatically built over the hidden interface and being used to synchronize databases on both the active processor and the standby processor as recited in claims 1, 11, 12, 13, 19, 37, 38, and 39. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be

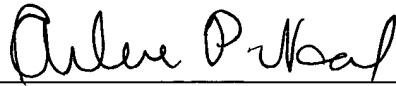
withdrawn because neither Baskey et al. nor the Official Notice whether taken singly or combined, teaches or suggests each feature of claims 1, 13, 19, and 39 and hence, dependent claims 7, 8, 15, 24 and 41 thereon.

As noted previously, claims 1-51 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It is therefore respectfully requested that all of claims 1-51 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Arlene P. Neal
Registration No. 43,828

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

APN:kmp
Enclosures: Additional Claim Fee Transmittal (1)
Check No. 13310

IN THE DRAWINGS:

Further to the objection to the drawings in the Office Action, attached are replacement sheets.